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ABSTRACT

Described is the development of a diagnostic/prescriptive system--developed as part of the Pendleton Project--which would aid in the understanding of causes and ultimate treatment of dysfunctional behavior in 6- through 12-year-old children. Reported are the objectives and rationale of the Pendleton Project, an interdisciplinary, community based treatment center directed toward reeducating children with behavior problems and their families so that future maladaptive behavior is unlikely to occur. It is noted that data has been collected on a sample of 53 families to accomplish three objectives: to determine the characteristics that separate the control group from the treatment population; to eliminate those variables that have little or no diagnostic value; and to cluster the remaining variables so that they identify children who share other common characteristics and functional or dysfunctional behaviors. Explained is the process used for identifying 834 variables, and provided are results of the analysis along with interpretation of the data for the 44 data elements taken from the original 834 variables. (Author/SBH)

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A DIAGNOSTIC/PRESCRIPTIVE SYSTEM TO AID IN THE TREATMENT OF BEHAVIOR DISORDERS

By

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INTRODUCTION

All sectors of society are affected by dysfunctional behavior in children. The child in the family who displays behavior disorders has an impact on the other members in his family as well as on the members of his immediate neighborhood and community. He brings these behavioral problems to school and often has a negative impact on both his teachers and fellow classmates. In most cases, none of these people, i.e. his family, neighbors, teachers or schoolmates, knows how to deal with this negative dysfunctional behavior. In fact, many believe that the society surrounding the dysfunctional child often inadvertently supports or rewards the child's dysfunctional behavior. This is a serious problem when you consider that these are the people with whom the child will spend approximately 98 percent of his time during his young life.

These same problems, if not dealt with at an early or young age, will often become more severe as the youth matures. These behavior problems will obstruct the child's normal functional development process, causing the child to fall behind both cognitively and emotionally. Such a child often becomes more and more rejected by the people in his immediate surroundings who do not understand him and have no idea as to how to deal with such a child. The child often begins to feel a greater sense of isolation from his society and sometimes loses his sense of being a part of that society.

The Report of the Joint Commission on Mental Health of Children (1970) stressed the importance of community. One vital aspect of a child's growth at midstage is the development of his sense of being a part of his community. He needs to feel an identification with his community, and he needs to acquire

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large amounts of knowledge and large numbers of skills so that he can become an effective member of it. Communities are built upon common consent, communication, and common knowledge of their members. Children can develop a need and real sense of community commitment only if they and their parents find that the community has real commitments to them as individuals, and that the community is really interested in their well-being.

For children displaying behavior problems this support from their surrounding community is often lacking. Many times this lack of support occurs because the community has no knowledge of how to treat or react to the behavior of such children. The gut reaction is often a lack of approval, anger or hatred. So, as the child grows up in this environment, society has aided the process of creating an individual who becomes a problem, sometimes an actual menace, to society. This child often becomes of little worth to himself, getting into more and more trouble at the expense of society. The cycle often ends with the individual committing a serious crime and society lashing out at the individual in an even hasher manner. The individual becomes more hardened and difficult to reach and at some point becomes a hopeless case who is destined to do nothing but bring hardship to the lives of all he touches.

The Pendleton Project was started in the hope of learning more about a child's behavioral problems as they manifest themselves in the local community and about their ultimate treatment. It is based on the importance of appropriately treating behavior problems at a young age before they become more severe. However, in addition to the treatment of behavior problems, the Pendleton Project wished to develop a diagnostic/prescriptive system which could be used by the untrained members of the child's family, community, teachers, and maybe even friends in knowing how to deal with children displaying various forms of dysfunctional behavior. After all, it is with these people that the child is going to spend the majority of his youthful life. If the community that the child enters does not give the child the needed support, it is much less likely that the professional counselor in his limited contact with the child is going to have as great a long-term impact. Therefore, the Pendleton Project wanted to identify classes or types of dysfunctional behavior, characteristics which describe the child and his background, and treatment approaches which have been most

successful griven the type of dysfunctional behavior and the child's background. This would become a "Diagnostic/Prescriptive System for the Treatment of Behavior Disorders."

The results of this work will be used for three initial purposes. The first will be internal use by the Pendleton Project and similar agencies for the treatment of children who are demonstrating antisocial behavior. The results will provide an effective model for the rehabilitation of children who are displaying antisocial behavior before it becomes a more serious social problem. The second use might be to provide schools with a simple diagnostic/prescriptive system for children who are displaying behavior problems in the school. Teachers, counselors, and principals could use the diagnostic treatment presciptions within the school classroom to try to improve student behavior. The last but certainly not the least effective outcome might be the development of social preventive measures. Once the common characteristics that have causal effects with dysfunctional and antisocial behavior have been identified, various public services' brochures and promotions could be developed for community education programs to make parents and the community aware of the kind of background characteristics that can cause young children to develop behavioral problems. An example of the prevention approach might take the form: "If this is the kind of homelife and background you are providing in your family or commumity, you are likely to be creating behavior problems in some of your children. Similar backgrounds have caused children to be miserable and in trouble their entire lives. This is at a high cost to both the individual and his surrounding society. Now is the time to do something about it before it it too late." The information could point out that services are available at Pendleton and elsewhere that are designed to improve the quality of life. In addition, mass education programs aimed at prevention could be placed in newspapers, radio, and television. All three of these outcomes are dependent on the type of research and treatment efforts which are now being carried on at the Pendleton Project.

The Pendleton Project

The Pendleton Project is an interdisciplinary treatment program for children in trouble. The project serves the localities of Chesapeake and

Virginia Beach (610 square miles) in southeastern Virginia. It is a community-based treatment center directed toward reeducating children with behavioral problems and their familites so that future maladaptive behavior is unlikel to occur.

Emphasis is placed on treating those behaviors that suggest antisocial development and which are likely to require some kind of intervention. The project resources are designed to treat behavior disorders that may be a fucntion of inappropriate learning, perceptual or learning disabilities, or emotional adjustment difficulties. The project's intention is to intervene where antisocial behavior exists, whenever reasonable and proper, early enough to prevent or reduce the necessity for contact with other human services such as juvenile justice, social services, mental health services, etc.

The project has developed diagnostic treatment procedures directed toward making children in trouble and their families socially competent so that they may function within the social order more effectively. They are taught ways to solve the problems of living.

The objectives may be stated as: (1) to develop a diagnostic prescriptive system which will allow for the identification of major underlying causes of dysfunctional behaviors, the classification of common underlying causes and behavioral problems, and finally, the development of treatment programs which are most effective for children who share common casual characteristics and behavior problems; (2) to develop a comprehensive treatment program to correct antisocial development as early as possible; (3) to discover ongoing antecedent behaviors that may lead to future antisocial behavior and result in a maladaptive life style; (4) to develop new resources and coordinate existing resources; and (5) to measure the effectiveness of the work.

Rationale

The underlying assumptions, evaluation designs, and statistical procedures used for this effort are reported in detail in earlier semiannual reports (Pooley, 1976a; Pooley, 1976b) and an ODU Research Foundation report (Cunningham, 1976). A review and the current status of this work is reported here.

In medicine and other forms of treatment programs, comprehensive studies of causes and must be made to determine why specific forms of illnesses exist.

It is difficult, at best, and most of the time impossible, to come up with consistent cures for an illness until the actual cause of that illness has been isolated and identified. The work at the Pendleton Project is based on this very simple but basic premise. It is difficult or impossible to treat antisocial behaviors without some common understanding of the causes of those behaviors and a scientific base for the selection of the appropriate treatment method.

For this reason, the Pendleton Project is collecting data on the background characteristics of Pendleton children and their familites for the purpose of an accurate description of such a child and his life space. Children who then share common background characteristics can be classified as to similarity of personality, background, and dysfunctional behavior. This data can then be examined to isolate and identify unique characteristics shared by one type of child, but which are not present among other types of children. These characteristics will then be examined more closely to determine if a causal relationship can be established. The treatment programs that have been most effective with the students who share common characteristics will then be used as prescriptive programs for other children who are identified as having similar personalities, backgrounds, and dysfunctional behaviors. Therefore, a diagnostic prescriptive treatment mechanism may be tested.

In order to effectively treat a disorder of any sort, the practitioner must have a clear understanding of exactly what is to be treated. Then he or she may prescribe and/or carry out the appropriate procedure(s) to correct the situation. Then, followup should be done to determine whether or not the procedure is working. If it isn't, then changes should be made as indicated by the followup investigation and necessary modifications made to the diagnostic prescriptive system.

The treatment of behavior disorders (i.e., acting out) or dysfunctional families is no exception to this rule. The acting-out child is characterized by behaviors such as excessive fighting, defiance, property destruction, tantrums, poor academic achievement, etc. Accordingly, the Pendleton Project has designed a reasonable and potentially effective method of addressing the problem. Considerable attention has been given to the development

of a workable diagnostic prescriptive tool because the acting-out child "is considered to be the most difficult of all child patients to treat." (Kay, 1976).

The Pendleton Project has treated and collected data on 572 families who have been referred to it. Similar data has been collected on a control sample (N=53). The data set is very extensive, consisting of 834 demographic, behavioral, developmental and personality variables. These data are analyzed to accomplish three objectives: (1) to determine the characteristics that separate the control group from the treatment population; (2) to eliminate those variables that have little or no diagnostic value; and (3) to cluster the remaining variables so that they identify children who share characteristics common to specific dysfunctional behaviors and treatment approach, and yet who are significantly different from children who share other common characteristics and functional or dysfunctional behaviors. Thus, discrete subgroupings are arrived at from a diagnostic point of view. The next step is to examine the kinds of treatment that were administered to each subgroup for similarity.

If similarities exist in the treatment(s) that worked within each subgroup but are dissimilar among other subgroups, then we have a parsimonious diagnostic/prescriptive treatment mechanism that is easily understood and efficiently administered. Children are classified as to subgroup, and then the treatment that has proved most effective for that subgroup in the past is used to treat the new child.

Outcomes

As a result of this process, a diagnostic questionnaire may emerge that has only those items that are relevant to our purpose. It is anticipated that the present 834 items can be reduced to less than 300 that are very powerful indicators of subgroup characteristics. When a family completes the questionnaire and it is scored, they may be assigned to a treatment category that has worked in the past.

Clearly, this process reduces guess work. It has a high degree of clarity and identifies the choice of treatment very rapidly. It should also greatly increase the probability of success since, instead of randomly choosing a treatment approach, one is selected on the basis of its

success with similar types of students in the past. Thus, it is probable that the elements of the disorder are understood and treatment appropriate to correcting the problem is being delivered.

At the present time, 220 cases have been analyzed with a goal of reducing the data set. The initial 834 variables have been reduced and clustered into 44 identifying characteristics which can be used to describe Pendleton children.

Parsimonious Data Reduction

The major purpose of this initial research, in an attempt to reduce the large number of data elements now describing children, is to cluster questions within instruments in terms of a fewer number of independent but logically descriptive subscales. It was hypothesized that there are a relatively small number of descriptive subscales which can be used to account for much of the variability in the many variables presently being used to describe the children. Factor analysis using principle component factors was used to determine if there were some underlying patterns or relationships which existed such that the data could be "rearranged" or "reduced" into a smaller set of "factors" or "components" that could be used as subscales in describing the children. These subscales could then be used as new variables for describing children in an attempt to identify types of children and dysfunctional behaviors.

The original Pendleton data set contained 834 variables which were used to describe the children. There were eight different instruments that were used to collect this data. These instruments were (1) Piers-Harris self-concept scale; (2) Demographic Data Form; (3) Developmental History Form; (4) Parent Behavior Rating Scale; (5) Teacher Behavior Rating Scale; (6) Child California Personality Scale; (7) Parent California Personality Scale; and (8) Childrens Self-Concept Index. Other data available on children were their age, number of siblings, grade, IQ (group test), IQ (individual test), PIQ, VIQ, Math Achievement, Language Arts Achievement, Reading Achievement, Writing X's scores and Dotting Test scores. The problem was to reduce this comprehensive mass of data collected on students into a smaller interpretable subset.

The researchers analyzed the data collected on Pendleton children using both multiple regression and factor analyses. Multiple regression analysis along with factor analysis using principle component analysis was used to eliminate unrelated and/or uninterpretable questions. The analysis included determining what data most logically can be related and reduced. The reduction process involved the identification of subscales or factor scales which best describe the large number of variables in terms of a few relatively independent subscales. The results included the appropriate methodology needed to develop a student descriptive record along with an efficient profile on each child..

Methodology

The first step of the analysis was to do a multiple correlation using each question within an instrumental as a dependent variable and all other questions within the questionnaire as independent variables. If the other questions within the instrument could not be used to significantly predict the dependent question then the dependent question was unrelated to all other questions within the instrument. Therefore, this question was not useful in describing Pendleton children because it could not be interpreted and would not have a strong reliability coefficient. These questions were considered junk questions.

The second step was an iterative process using factor analysis with principle factors to abstract subscales which could be used to reduce the large percentage of variability which existed in the data used to characterize the students. The steps required in the determination of factors for data reduction were (1) the extraction of initial factors; (2) the rotation of these factors to a terminal solution; (3) the search for simple and interpretable factors or subscales; and (4) the elimination of variables which would not load on any of the identified factors. The basic approach was principle factoring with iteration.

Many alternative parameters had to be tested in coming to an optional solution which met the basic requirements of Thurstone's conditions for simple structure. Some of these considerations were number of factors to rotate, values in the diagonal, methods of rotation, and delta values.

Thurstone (1947), in his book Multiple Factor Analysis, set forward an objective definition of simple structure and an accompanying objective procedure for a simple structure solution. By way of definition, Thurstone states, "If a reference frame can be found such that each test vector is contained in one or more of the . . . coordinate hyperplanes, then the combined frame and configuration is called a simple structure (p. 328)." Thurstone's (p. 335) criteria for a simple structure solution were as follows:

1. Each row of the factor matrix should have at least one zero.

2. If there are m common factors, each column of the factor matrix should have at least m zeros.

3. For every pair of columns of the factor matrix there should be several variables whose entries vanish in one column but not in the other.

4. For every pair of columns of the factor matrix, a large proportion of the variables should have vanishing entries in both columns when there are four or more factors.

5. For every pair of columns of the factor matrix there should be only a small number of variables with nonvanishing entries in both columns.

If the multiple-factor solution satisfies the five criteria listed above, it is to be accepted as stable and ready for interpretation.

Next, each of the identified factors had to be interpreted. Interpretation required the thorough examination of each factor to determine its common characteristics. Questions that had the highest loadings on the same factor were used to interpret the factor. Items with loadings of above .30 on a factor were inspected, and the factor was named by considering the content of items with the highest loadings. A descriptive term which identified the common characteristics of the factor was assigned to each of the subscales.

The final step was the calculation of factor scores for each student on each subscale. The factor scores were used to describe each of the students. The factor scores are computed by multiplying the response to each question by the factor score coefficient for each question and summing the results over an entire factor to come up with a total factor score. Factor scores, one each subscale, were calculated for every student in the Pendleton sample.

Findings--Data Reduction

The reduction process involved the identification of subscales or factor scales which best describe the large number of variables in terms of a few relatively independent subscales. Principal component analysis, factor analysis, and multiple regression analysis were used in this process. Each analysis required an iterative process in which multiple runs had to be made with minor variation in major program parameters. The end result was stable and interpretable factors.

This report contains the results of this analysis along with the interpretation of the data. The data and its interpretation provided the needed information to begin much more concrete studies which should provide for the development of the diagnostic/prescriptive system. However, this system could not be developed until the mass of data that existed was placed into some interpretable form. The data now has that interpretable form. The results reported below provide for many options which might be selected for future analysis. The findings of such analysis should be most significant for the Pendleton Project specifically and hopefully for the professional community in general.

The 834 original variables which were first used to characterize students were reduced to the following 44 data elements:

1. Age
2. Number of Siblings
3. Grade
4. Group IQ Test
5. Individual IQ Test
6. PIQ Score
7. VIQ Score
8. Math Score
9. Language Arts Score
10. Reading Score

11. X's Attempts

12. X's Correct

13. DOT Attempts

14. DOT Correct

15. Piers-Harris Total Score

16. Average American Family -- The child has brothers and/or sisters, is developing physically, is healthy, attends a public school, and lives with real parents. The parents are healthy, married only once, educated, practice religion, and the father is employed. The family lives in a single-family dwelling in a suburban neighborhood that is congruent with neighborhood and receives a higher income. (A high score on this scale suggests these conditions exists; a low score suggests these conditions do not exist.)

17. Counseling Services Recipients (older parents) -- The child has a middle aged mother and an older father, and almost all members of the family are receiving counseling services. (A high score on this scale suggests these conditions exist; a low score suggests these conditions do not exist.)

18. Unstable Low Socioeconomic Family -- The child is not the youngest in the family, not a member of clubs, and is not living with the natural father. The mother is middle aged, married more than once, herself from a broken home, and she has a court record. The child's younger siblings are exhibiting behavior problems. The family is a low income family living in public housing and/or an urban environment. (A high score on this scale suggests these conditions exist; a low score suggests these conditions do not exist.)

19. Older Father and Younger Educated Mother -- The child is healthy, has a younger mother, who is well educated, often married more than once, and an older father who is less educated. The family practices a religion and lives in a single-family dwelling which they own. (A high score on this scale suggests these conditions exist; a low score on this scale suggests these conditions do not exist.)

20. Inactive Male (not living with natural mother) -- The child is a male who is very inactive and is not a member of any type of club. He is not living with his natural mother, and his mother figure and father or father figure are less educated.

21. Young Educated Stepfather and Young Mother (marital problems -- The child is the oldest in the family. He is living with a stepfather who is young and educated. He has a young mother who is less educated. The family has a low income, and the parents are receiving marital counseling.

22. Active Early Training by Mother -- The mother took an active role in toilet training the child. The mother also took responsibility for various games and activities with the child. The father's main activity was in the area of basic needs (i.e., feeding, changing). (A high score indicates that the mother took a very active role in training the child; a low score indicates the mother did not take an active role.)

23. Active Child Disciplined Negatively by Mother and Positively by Father -- Mother is considered the disciplinarian using negative reward or punishement such as whipping, spanking, deprivation of privileges, scolding, etc. Father provides positive rewards such as praising, material rewards, earning privileges, etc. The child engages in active play with both siblings and nonsibling playmates. (A high score indicates an active child disciplined by mother and praised by father; a low score indicates that these conditions do not exist.)

24. Antisocial Behavior -- The child stays to himself, runs away, demands his own way, is resentful, continues maladaptive behavior, quits, is cruel, makes excuses, and cries. (A high score on this scale indicates the child is antisocial and displays these characteristics; a low score on this scale indicates the child is social and does not exhibit these characteristics.)

25. Older Pregnant Working Mother -- The mother was over 40 when she had her child. She worked while she was pregnant and continued to work after she had the baby. (A high score indicates the presence of these conditions; a lower score indicates their absence.)

26. Early Abnormal Behavior -- Prior to age six, the child displayed abnormal behaviors such as bed wetting, worrying, speech defects, fears,

jealousy, bashfulness, stealing, temper tantrums, disobedience, disagreement, destructiveness, and aggressiveness. (A low or negative score means the child exhibited these behaviors; a zero or positive score suggests the child does not exhibit these behaviors.)

27. Old Father Young Mother/Weaned Early -- The father was often older, even in his 50's, while the mother was 12-19 when she had child. The child was fed when he woke at night, but was weaned at three months or less. The child complains that other children don't like him, has nightmares, and plays with fires. (A high score means these conditions existed; a low score means that they did not.)

28. Father Active with Child/Weaned Late -- The child weaned himself at between 4 to 12 months. The father engaged the child in such activities as lap games, indoor games, outdoor games, reading, conversation, etc. The mother provided encouragement such as praise and earning privileges. The child thinks other children like him. (A high score means that these characteristics are present; a low score means that they are not).

Parent Behavior Rating (29. - 31.)

29. Selfish, Self-centered and Irritable Child -- The child upsets easily, is nervous, frustrates quickly, hits and pushes, teases, feels sorry for himself, accuses, complains, overreacts, does only what he wants, is explosive, rebellious, disrespectful, and has little feeling for others. (A high score would indicate that a parent described the child as having these characteristics; a low score would suggest the parent described the child as not having these characteristics.)

30. Well-behaved Child -- The child gets along well, shares, completes work, is truthful, calm, and respects others. The child demonstrates self-control, cooperates, accepts and handles responsibility, works well and is a natural leader. (A high score on this scale indicates that a parent describes his child as having these characteristics; a low score would mean the parent describes his child as not having these characteristics.)

31. Dopey, Sloppy Child -- The child has trouble holding on to things, has poor handwriting, accidentally runs into things, has messy

drawings and a poor memory. The child daydreams, blames himself, seems nervous, often rocks back and forth, gets tired quickly and overreacts to situations. (A high score on this scale indicates that parents describe the child as having these characteristics; a low score indicates the parents do not believe the child has these characteristics.)

Teacher Behavior Rating (32. - 35.)

32. Selfish, Self-centered and Irritable Child -- The child upsets easily, is nervous, frustrates quickly, hits and pushes, teases, feels sorry for hemself, accuses, complains, overreacts, does only what he wants, is explosive, rebellious, disrespectful, and has little feeling for others. (A high score would indicate that a teacher described the child as having these characteristics; a low score would suggest a teacher described the child as not having these characteristics.)

33. Well-behaved Child -- The child gets along well, shares, completes work, is truthful, calm, and respects others. The child demonstrates self-control, cooperates, accepts and handles responsibility, works well and is a natural leader. (A high score on this scale indicates that a teacher describes the child as having these characteristics; a low score would mean the teacher describes the child as not having these characteristics.)

34. Dopey, Sloppy Child -- The child has trouble holding on to things, has messy drawings and a poor memory. The child daydreams, blames himself, seems nervous, often rocks back and forth, gets tired quickly and overreacts to situations. (A high score on this scale indicates that teachers describe the child as having these characteristics; a low score indicates the teachers do not believe the child has these characteristics.)

35. Good Student -- The child tells interesting stories, initiates discussion, seeks out teachers' help, takes active part, is able to apply new learning, and is responsive. (A high score on this scale indicates the teacher would describe the child as having these characteristics; a low score indicates the teacher does not believe the student has these characteristics.)

36. Child Socialization Scale --

"Gough's original goal was to construct a delinquency scale based on his role-taking theory of sociopathy (Gough, 1948c; Gough and Peterson, 1952). Subsequent research indicated that the scale reflected not just delinquency, but a full range of socialization. In more recent writings, Gough (1965a, 1968a, 1969b) has indicated that the scale reflects the degree of social maturity, integrity, and rectitude the individual has attained. It orders individuals along a continuum from asocial to social behavior and forecasts the likelihood that they will transgress the mores established by their particular cultures (Gough, 1965b). In contrast to Re and Sc, the So scale thus measures the extent to which values are internalized and made useful in the life of the individual (Gough, 1965a)."

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38. Child's Self-Concept (CSCI) --

This scale measures a child's beliefs related to the attitude that others have toward him. It relates to whether the child believes that others have respect for him and think that he is a worthy individual. It is also related to the child's belief related to his ability to do things as compared to other children. This scale also includes some references to

the child's attitude toward himself directly. It is a measure of how important the individual perceives himself in relation to other individuals.

39. Behavior. I do many bad things (.66); I am obedient at home (-.64); I am often in trouble (.60); I think bad thoughts (.55); I can be trusted (-.53).

40. Intellectual and School Status. I am good in my school-work (-.66); I am smart (-.63); I am dumb about most things (.56); I am a good reader (-.55); I forget what I learn (.53).

41. Physical Appearance and Attributes. I am good-looking (-.74); I have a pleasant face (-.61); I have a bad figure (.56); I am strong (-.41); I am a leader in games and sports (-.40).

42. Anxiety. I cry easily (-.57); I worry a lot (-.57); I am often afraid (-.55); I get nervous when the teacher calls on me (-.54); I am nervous (-.49).

43. Popularity. People pick on me (-.62); I am among the last to be chosen for games (-.61); It is hard for me to make friends (-.56); I have many friends (.55); I feel left out of things (-.49).

44. Happiness and Satisfaction. I am a happy person (.65); I am unhappy (-.62); I like being the way I am (.60); I wish I were different (-.57); I am cheerful (.42).

These variables then make up the entire data set which is used to describe children. Each of the 44 variables are used as descriptive information to characterize the child.

Analysis and Classification of the 220 Students as to Personalogical/Dysfunctional Type

Children were classified as to personalogical types using a combination of factor analysis and discriminant fucntion analysis. The 44 variables identified in Parsimonious Data Reduction were used to describe the children in this second analysis. All necessary tests were made to insure that the solution was stable for interpretation. The results of the analysis were interpreted, and a report documenting the purpose, method and results of

the analysis is available (Cunningham, 1977). Using the 44 data elements that are now used to describe the Pendleton children, the researchers identified logical types of children who were similar to one another and dissimilar to other children -- homogeneous among themselves and heterogeneous from other types of children. Similarities in their characteristics were analyzed to see if those similarities caused children to have common dysfunctional behaviors. Various treatment approaches were examined to see if one approach might be more effective with one type of child than another.

The purpose of this analysis was to identify children who were similar to one another based on the 44 characteristics used to describe children. Once the type of child had been issolated, the characteristics which were predominant in classifying the child as to a type were identified and examined. It was necessary to describe the membership of each child type. Interpretation consisted of examining all individuals within a type and assigning a descriptive term which, in the researchers' judgement, identified the common characteristics of the children. Treatment records and descriptive information related to the child's behavior problems were examined for each personalogical type of child to see if they shared common behavioral problems. If a shared behavioral problem was identified for a child type, then the personalogical variables used to describe the child type were examined by the professional staff at the Pendleton project in an attempt to establish predictive cause and effect relationships. Such information would be used to develop preventative programs for behavioral problems.

If specific characteristics in a child's background seemed to be related to a child's behavioral problem and these same conditions existed in other children displaying this behavioral problem, then it could be hypothesized that a cause and effect relationship might be established. Related literature could be searched to see if any other research had found similar descriptive characteristics to be highly related to behavior dysfunctions. Further research could be planned to investigate these cause and effect relationships. The results of such research would be to develop a preventive approach to child mental health and behavior. By educating the public as to background personalogical variables that have been highly prevelant among children displaying behavioral disorders, the general

public might be able to eliminate such conditions from a child's environment. The preventive program would be aimed at eliminating conditions and characteristics which have been known to be highly associated with dysfunctional behavior in children.

After possible cause and effect relationships were identified, the students within a student type were classified as to treatment approaches that were used to treat the child's dysfunctional behavior. The success of the treatments were compared in relation to concrete data such as the number of dysfunctional behaviors displayed after treatment, improvement in Piers-Harris Self-concepts, and using general impressions from staff members, parents and teachers. The treatment that was most effective with that child type could then be used in a diagnostic/prescriptive model. This would be for a curative approach to behavioral problems in children.

New children displaying behavioral problems could be administered the battery of tests upon entering a treatment program. The tests could be scored so that the child would have the 44 descriptive characteristics describing him. A discriminant function analysis could then be run so that the new child could be classified as to an appropriate child type. Once the child has been classified, the best treatment approach could be identified. Whatever treatment approach that was most succesful with that type of child in the past would be used for the new child. This should greatly increase both the probability and speed of success in helping the child to develop more functional behavior. Characteristics in the child's environment which have caused dysfunctional behavior in children such as this new one could be discussed with both parents and teachers in an attempt to eliminate some of these background characteristics associated with his behavioral problem.

The model is based on the belief that what has been most successful in treating a specific type of child displaying a specific dysfunctional behavior in the past should be most successful in the future for treating a similar type of student displaying this same behavioral problem.

Method for Classifying Children as to Personalogical Type

It is hypothesized that there are a relatively small number of different types of children which accounts for much of the variability in the persona-

logical characteristics used in this study to describe children. The identification of types involved the description of a large number of children in terms of a few relatively independent factors. It was assumed that the number of dysfunctional types of children will vary between one, the case when all children were located on and described by one axis, and N, the total number of students in the student population, the case when each student was located on and described by his own independent axis.

A Q-mode factor analysis was used to determine whether there were identifiable types of children with respect to the personalogical measures used to describe children in this study.

A Q-mode factor analysis was completed using 100 students as variables and the 44 measures previously discussed as cases. Profiles of the personalogical types of children were examined in an attempt to identify the salient characteristics of the members of each type. Each child type was assigned a name that described the characteristics common to all members of the student type.

The SPSS factor analysis program was used in the factor analysis of children. The SPSS factor analysis program will process unlimited cases, each characterized by up to 100 variables. This was a physical limitation due to the size of the problem and the amount of core storage required. There were 220 children or variables, a number which was well in excess of the limit of 100. Therefore, 100 students were randomly selected for use in the Q-mode factor analysis.

A discriminant function analysis was completed to classify the remaining 120 students into one of the student types identified by the factor analysis. The multiple discriminant function analysis was completed using the student groups as criteria and the 44 measures used in the Q-mode factor analysis of children as variables. The UCLA Bio-Medical Program Stepwise Discriminant Analysis (BM07M) was used to classify each of the 120 remaining students into one of the appropriate student types. The SPSS and BMD07M programs were available through the Old Dominion University Computation Center.

This same discriminant function analysis would be used for classifying all future cases. When a new group of children participated in the Pendleton Project, they would be administered the set of data collection instruments. These instruments would be scored and reduced to the 44 variables.

These 44 variables would be used in the discriminant function analysis to classify the children according to the personalogical type of child to whom they were most similar.

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